

Students' Notetaking: The Effects of Teacher Immediacy and Clarity

B. Scott Titsworth

Lecture listening is one of the most common classroom experiences for college students. Unfortunately, students are relatively inefficient notetakers in these situations; in fact, students record less than 40% of the information from lectures. This experiment explored the effects of two lecture cues, immediacy and organizational statements, on students' (n = 104) notetaking effectiveness. Results indicated that students recorded more details and organizational points when listening to lectures with prominent organizational cues, and they also recorded more details when listening to lectures with lower levels of immediacy. The number of details and organizational points recorded in students notes were strongly related to learning outcomes as measured by three separate tests.

Keywords: lecture cues; organizational cues; immediacy; notetaking; cognitive learning

Lecture listening is one of the most important study skills used by college students (Johnson, Vinson, Hackman, & Hardin, 1989). In fact, Armbruster (2000) reported that average college students spend roughly 80% of their weekly in-class activity listening to lectures. Because lecture listening is one of the most challenging cognitive tasks faced by college students (Ryan, 2001), understanding processes through which students can select, organize, and interpret lecture information should be of prominent concern for instructional communication researchers.

Notetaking is perhaps the most obvious tool for students to use when listening to professors' lectures. Not surprisingly, 99% of college students report frequent use of notetaking (Palmatier & Bennett, 1974), and a similar percentage of students value notetaking as an important learning activity (Dunkel & Davy, 1989). Although students understand the necessity of notetaking (Badger, White, Sutherland, & Haggis, 2001), many students are ineffective notetakers; students typically record

B. Scott Titsworth (PhD, University of Nebraska, 1999) is an assistant professor in the School of Communication Studies at Ohio University, Athens, OH, 45701. Portions of this manuscript were based on the author's dissertation directed by Dr. William Seiler, University of Nebraska. The author would like to thank Drs. Kenneth Kiewra, Judy Pearson, Paul Nelson, and Elizabeth Graham for feedback on earlier versions of this manuscript. Scott Titsworth can be contacted at titswort@ohio.edu

only 20–40% of the important ideas presented during a lecture (Kiewra, 1985; Kiewra, Benton, & Lewis, 1987). Besides having incomplete notes, students also vary in the precision with which they record notes. In lecture situations, “some students (using shorthand) seem to want to record everything said by the lecturer,” observed Hartley and Davies (1978), “others to pick and choose relevant points, and others to indulge in a certain amount of doodling whilst they listen” (p. 207).

The lecture–notetaking relationship presents a practical problem for both teachers and students. Teachers, faced with situational demands and molded identities, view lecturing as the “sacred cow” of university instruction (Carrier, Williams, & Dalgard, 1988, p. 223). If lecturing is a teacher’s sacred cow, then notetaking is a student’s Holy Grail: The number of ideas recorded in students’ notes account for nearly 50% of the variance in students’ test scores (Titsworth & Kiewra, 1998).

Because notetaking is important, common, and problematic for many students, the purpose of this study was to explore how two teacher communication behaviors, use of organizational cues and immediacy, influence notetaking. The study consisted of an experiment testing whether the prominence of organizational cues and immediacy influenced the number of organizational points and details recorded in students’ notes. Previous research suggested that the organizational points and details recorded in students’ notes would be positively associated with performance on tests of lecture recall.

Notetaking Cues and the Learning Process

Effective notetaking requires vigilance on the part of students. As noted by O’Hair, O’Hair, and Wooden (1988), “meaningful notes result from carefully planned listening for structure and from fighting distractions, not from random selection and writing” (p. 114). Subsequent sections discuss the importance of notetaking as well as steps teachers can take to help students be more effective and vigilant notetakers.

The Relationship Between Notetaking and Learning

Two complementary reasons explain the success of notetaking as a learning strategy. First, notes provide students with an external storage mechanism for information (Rickards & Friedman, 1978). The process of notetaking also helps students encode information into memory because students must pay attention to, organize, and interpret lecture information (Bretzing & Kulhavy, 1979). The encoding function of notetaking is particularly relevant to the current study. If teachers’ communication behaviors are related to student learning, we would expect clear differences in the notes taken by students based on the communication behaviors of the teacher. In short, notes taken by students can provide a unique way of determining how students encode lecture information and, consequently, can provide a new approach for assessing the relationship between teacher communication behaviors and student learning. For this approach to be valid, however, a relationship must exist between notetaking effectiveness and learning outcomes.

Notetaking has consistently been identified as the most important learning strategy available to students in lecture situations (Kiewra, 1984). Fisher and Harris (1973) explored the relationship between notetaking and recall and found correlations ranging from .28 to .53. Titsworth and Kiewra (1998) added new information to this line of research when they distinguished between organizational points and details recorded in students' notes. Organizational points were defined as structural elements (e.g., advance organizers, main and subordinate ideas, etc.) which were recorded in student notes. For example, students might record the main ideas covered in a lecture as well as corresponding subtopics that elaborate main ideas. Noted organizational points are contrasted from noted details, which are specific definitions, explanations, or examples provided by the lecturer. In a subsequent study by Titsworth and Kiewra (2004), correlations between the number of noted organizational points and students' achievement test scores ranged from .49 to .76, whereas the correlations between noted details and achievement test scores ranged from .47 to .70. The first hypothesis predicted that the positive effects of notetaking on achievement could be replicated, thus providing evidence of validity for using notetaking to assess learning in the current study:

H1: The number of details and organizational points recorded in students' notes will be positively correlated with students' achievement test scores.

The Influence of Lecture Cues on Students' Notetaking

Lecture cues are verbal and nonverbal behaviors used during lectures that serve to heighten students' awareness (Titsworth & Kiewra, 2004). In form, lecture cues tend to be either written (e.g., a handout or computer projection) or oral (e.g., verbally stressing ideas). Although educational psychologists have devoted specific attention to the use of written lecture cues (e.g., Scerbo, Warm, Dember, & Grasha, 1992), communication researchers have traditionally been concerned with the use of oral cues used by teachers during lectures (e.g., Kelley & Gorham, 1988; Titsworth, 2001a, 2001b). In addition, lecture cues differ in purpose. When reviewing studies on lecture cues, Titsworth and Kiewra (2004) observed that although their purposes often overlap, most cues are designed to (a) stimulate student interest, (b) signal the importance of topics, and (c) signal the organization of ideas. Thus, some types of lecture cues are relatively discrete behaviors like passing out an outline of a lecture or using verbal signposts, whereas other lecture cues stem from global perceptions of teacher behaviors, such as the case with immediacy.

Teachers use immediacy, both verbal and nonverbal, to generate perceptions of psychological closeness with students (Andersen & Andersen, 1982). Rather than viewing immediacy as a discrete cue, instructional communication researchers have approached Mehrabian's (1981) concept of immediacy from a more global perspective. That is, rather than isolating specific teacher immediacy behaviors, immediacy has been operationalized as a high inference perception which may influence, or cue, other psychological reactions from students. For example, an impressive body of

literature has documented how teacher immediacy serves as an affective arousal cue for students (see Chesebro, 2003; Richmond & McCroskey, 1986; Titsworth, 2001a; Witt & Wheelless, 2001).

Immediacy may increase student interest and affect, but whether immediacy improves students' cognitive learning is less clear. Numerous studies in communication have found positive correlations between reports of teacher immediacy and students' perceptions of their own learning (e.g., Rodriguez, Plax, & Kearney, 1996). Because some controversy has stemmed from the use of self-report measures of learning (see Hess & Smythe, 2001), several recent studies have used experimentally manipulated lectures to determine whether teacher immediacy influences students' scores on recall tests (see Chesebro, 2003; Comstock, Rowell, & Bowers, 1995; Titsworth, 2001b; Witt & Wheelless, 2001). In general, these studies have found no direct causal relationship between teacher immediacy and students' test performance. Of course, the aforementioned experiments relied on recall tests as measures of cognitive learning. The current study adds new data to this line of research by using notetaking effectiveness to assess student learning.

Teacher immediacy has the potential to influence student learning in one of three ways. First, teacher immediacy may have no effect on students' cognitive learning. Second, teacher immediacy may create an ideal learning situation that heightens students' affect, thereby helping students pay more attention to lecture content. This possibility, described by Schonwetter (1993) as the optimal learning hypothesis, is partly supported by the numerous studies reporting relationships between students' perceptions of teacher immediacy and their self-perceived cognitive learning (e.g., Richmond & McCroskey, 1986). The third possibility is that extreme levels of immediacy could diminish students' cognitive learning from a lecture. According to McCaleb and White's (1980) delivery distraction hypothesis, students could become distracted by the delivery style of a teacher to such an extent that they fail to note important lecture information. This hypothesis is partly supported by Comstock et al.'s (1995) study that found a curvilinear relationship in the shape of an inverted "U" between teacher immediacy and students' cognitive learning.

If teacher immediacy influences students' cognitive learning from a lecture, evidence of this relationship should be apparent in the notes students take. If the optimal learning hypothesis is correct, students viewing high immediacy lectures should record more details (e.g., examples and definitions) and organizational points (e.g., structural indicators) in their notes. If the delivery distraction hypothesis is correct, students viewing high immediacy lectures should record fewer organizational points and details in notes. Conflicting evidence linking teacher immediacy with students' cognitive learning discourages a directional hypothesis relating teacher immediacy behaviors and students' notetaking effectiveness. However, because previous literature suggests that some relationship should exist, bi-directional hypotheses predicting differences in students' notes depending on the immediacy behaviors displayed by the teacher are possible:

H2: The number of details recorded in students' notes will be significantly different depending on whether the teacher displays high or low levels of immediacy.

H3: The number of organizational points recorded in students' notes will be significantly different depending on whether the teacher displays high or low levels of immediacy.

In addition to being immediate, teachers should also present organized information. Titsworth and Kiewra (1998) defined organizational lecture cues as detailed transition statements and signposts indicating macro- and microelements of lecture organization. Because organizational cues help students identify natural "chunks" of information, such cues possibly allow students to use short-term memory more efficiently (Cowan, 1995). Additionally, organizational cues likely help students develop new or more refined schema, which facilitate more accurate retrieval of information from long-term memory (Mayer, 1977). These assumptions have found strong support from studies experimentally testing the relationship between teacher clarity and student learning. For instance, Chesebro (2003) operationalized teacher clarity through his "Profile of Clear Teaching" (see p. 136) and observed an effect size of .53, whereas Titsworth (2001b) manipulated only organizational cues and observed an effect size of .13. In each case, teacher clarity improved recall. Because these studies examined recall after the lecture, the current study adds new information to this line of research by exploring the effects of organizational cues on students' notetaking, an indicator of learning during the lecture.

As with teacher immediacy, the relationship between organizational cues and learning should be reflected in students' notes. Because organizational cues make lecture structure explicit, students may record a greater number of organizational points in their notes when the lecturer uses these cues. Mayer (1977) also speculated that organizational clarity might improve students' ability to identify details; thus, when lectures contain organizational points, students may record more details in their notes. These assumptions generated the following hypotheses:

H4: The number of details recorded in students' notes will be greater when the lecture contains prominent organizational cues and smaller when the cues are minimal.

H5: The number of organizational points recorded in students' notes will be greater when the lecture contains prominent organizational cues and smaller when the cues are minimal.

Method

Participants

Participants in the study were 104 undergraduate students enrolled in the basic communication course at a medium-sized Midwestern university. More females ($n = 56$, 54%) than males ($n = 37$, 35.9%) participated—eleven of the participants did not report their sex. The average age of participants was 19.6 years ($SD = 1.3$), and they had been in school for an average of 3.42 semesters ($SD = 2.18$). Participants' self-reported GPA was 3.40 ($SD = 2.19$), and they reported spending an

average of three hours per week studying ($SD = 1.57$). Participants reported over 40 distinct majors, with the most common being Elementary Education ($n = 6$, 5.8%) and Business Administration ($n = 5$, 4.9%); undeclared students represented the largest portion of the sample with 16 participants (15.6%). Participants received course points for participation. Following procedures of the university Institutional Review Board, all participants were informed of their rights as human subjects prior to participation and an alternative activity was provided for those who wanted the course points but did not wish to participate in the study.

Experiment Manipulation

A lecture was scripted which discussed four communication theories: coordinated management of meaning, dramatism, systems theory, and media bias theory. These theories were selected because they were topically related to concepts covered in the basic course; however, these theories were not specifically addressed in the course. Thus, although the content was relevant to what students were learning, they had no specific prior knowledge of the concepts addressed in the lecture. Videotapes were then created with four versions of the same lecture. In each version, the lecturer described the theories, explained the context of communication most relevant to each theory, discussed how each theory explains communication in that context, and provided an example to show how each theory works. The scripts of the lectures were altered to contain either prominent or minimal organizational cues. In addition, presentations of the lectures were altered to contain characteristics of high or low immediacy. The teacher in the videotape was a female colleague who was not directly involved in the study. Because the lecturer was a former national collegiate oratorical speaking champion, she was easily able to control her delivery to conform to the high and low immediacy conditions.

In the lectures with prominent organizational cues, the script included explicit transitional statements and signposts. For instance, when introducing dramatism theory the lecture stated, "Now in the second point I will discuss dramatism theory." The lectures with prominent organizational cues also highlighted subordinate points with explicit cues. In the lectures with minimal organizational cues, the transition statements were less obvious but still present. For example, when presenting dramatism theory in the uncued lecture, the teacher stated, "Another theory is dramatism which can be described as ..."

To manipulate teacher immediacy the lecturer was coached to include, or not include, several of the immediacy behaviors identified in previous research (Andersen & Andersen, 1982; Gorham, 1988). In the high immediacy lectures, the teacher used "we" statements, established direct eye contact with the camera (the script was projected behind it), used facial expressions, moved about the classroom, and had substantial vocal variation. In the low immediacy conditions, these behaviors were absent. The teacher read the script from behind the podium and had very little vocal variance, few gestures, and minimal facial expressions.

The word count of the lectures ranged from 2091 words in the high immediacy with cues lecture (total time 17:17) to 2102 words in the low immediacy-no cues lecture (total time 17:30). The words-per-minute rate of delivery by the lecturer ranged from 120 wpm in the low immediacy-with cues lecture to 122 wpm in both the low immediacy-with cues lecture and the high immediacy-no cues lecture.

Measures and Scoring

Participants completed two scales used as manipulation checks for the experiment. The first scale was the nonverbal immediacy scale (McCroskey, Sallinen, Fayer, Richmond, & Barracough, 1996). The 14-item nonverbal immediacy scale was reduced to 10 items because items 1, 7, 9, and 13 addressed nonverbal immediacy behaviors irrelevant to the study (for example, "touching students"). Previous estimates of reliability for the teacher nonverbal immediacy scale have ranged from .69 to .89. In the current study, with four items removed, the Cronbach's (1951) alpha reliability estimate was .94. Participants also indicated their perceptions of how organized the lectures were by answering an 8-item semantic differential scale. The perceived organization scale asked participants to circle a number from 1 to 5 to indicate which adjective in the eight semantic pairs best described the lecture. Examples of semantic differential pairs included on the scale are precise/imprecise, organized/unorganized, and coherent/incoherent. Cronbach's alpha reliability was .91 for the perceived organization scale. Finally, students also answered one question that asked them to indicate how similar the lecture was to lectures they listen to in other classes, excluding from consideration the fact that the lecture was videotaped.

Three tests assessed students' learning from the lectures. The first test was called the concept test and asked students to answer 15 multiple-choice questions about concepts discussed in the lecture. Questions on this test were application-based questions. For instance, one question described a student discussing recruitment procedures with the executive officers of a campus student club. Participants answering this question correctly had to identify which context of communication the question was addressing and, consequently, which theory of communication would be most applicable to the example (i.e., systems theory). Each correctly answered question yielded one point. The KR20 reliability estimate for the concept test was .57. This reliability level was deemed acceptable because the test was explicitly designed to discriminate among test-takers and included somewhat heterogeneous items (see Streiner, 2003).

The organization test was second and asked students to provide an outline of the lecture from memory. Directions for the test told students that only the organizational structure was relevant and that details were not necessary. One point was awarded for each main and subordinate point written on the sheet. The scores for this test could range from 0 to 20.

The third test was the detail test. Students were given the main and subordinate points of the lecture and were asked to provide corresponding details (e.g., definitions, examples, and explanations). Because each of the four main points had four subordinate points, the scores for the detail test could range from 0 to 16.

Trained coders scored the organization test, detail test, and students' notes. During an initial orientation session, the two coders were familiarized with the materials and were given an opportunity to practice coding materials for 10% of the participants. Coders assigned scores for the tests by awarding one point for each correct answer. Students' notes were scored by awarding points for each organizational point recorded (note organization) and each detail recorded (note details). After discussing this process and comparing results, the two coders independently scored materials for all participants. To assess inter-coder reliability, Pearson product moment correlations were calculated between the two raters' scores. Averaging scores from the two coders yielded a single value for the following variables (inter-coder reliability estimates are reported in parentheses): organization test (.96), detail test (.88), note organization (.94), and note details (.96).

Procedures

Participants were involved in two phases of this study. In phase 1, participants were informed of their rights as research participants, asked to complete a demographic questionnaire, and randomly assigned to one of eight groups for phase 2. Each condition in the 2×2 (high immediacy vs. low immediacy and with cues vs. no cues) design included approximately 25 participants—the size of a normal class—and met during the mid afternoon. All meetings for phase 2 were scheduled over a two-day period during mid-week. The exact condition for each subgroup (e.g., the high immediacy without organizational cues) was randomly assigned before phase 2 was initiated.

After students were seated for their phase 2 meeting, they were told that they would watch a videotaped lecture and answer questions afterwards. Students were told that the department was testing the effectiveness of new teaching approaches for the basic course and were given three blank pieces of typing paper on which to take notes. After the appropriate video was shown, students completed the questions used to check for valid manipulation and were given five minutes to review their notes. Following the review period, students were given a packet with the three tests. Each packet was identically arranged with the concept test first, the organization test second, and the detail test third. Students received both oral and written directions to not go back and change or add answers on previous tests. Two proctors monitored students, answered questions, and reminded students to not go back and change answers on their tests. Data were analyzed using SPSS for Windows, version 11.5. Alpha was set at .05 for all statistical tests.

Results

Manipulation Checks

Analyses of students' perceptions of teacher immediacy and organizational clarity determined successful manipulation of immediacy and organizational cues. An

Table 1 Correlations Between Notetaking Effectiveness Variables and Achievement Test Scores

Variable	1	2	3	4	5
1. Concept Test	<i>.57</i>	<i>.34**</i>	<i>.61**</i>	<i>.34**</i>	<i>.39**</i>
2. Structure Test	<i>.46</i>	<i>.96</i>	<i>.65**</i>	<i>.68**</i>	<i>.65**</i>
3. Detail Test	<i>.86</i>	<i>.71</i>	<i>.88</i>	<i>.56**</i>	<i>.55**</i>
4. Note Organization	<i>.47</i>	<i>.72</i>	<i>.62</i>	<i>.94</i>	<i>.88**</i>
5. Note Details	<i>.46</i>	<i>.68</i>	<i>.61</i>	<i>.93</i>	<i>.96</i>

Note. Italicized coefficients in the diagonal are reliability estimates. Coefficients below the diagonal are corrected for attenuation due to unreliability.

*Correlation significant at the .05 level; **significant at the .01 level.

independent samples *t*-test revealed significant differences in students' perceptions of teacher immediacy between the high immediacy groups ($M = 31.04$, $SD = 3.07$) and the low immediacy groups ($M = 26.39$, $SD = 4.76$), $t = -5.78$ (102), $p < .05$. A similar procedure revealed significant differences in students' perceptions of teacher organizational clarity between the groups viewing lectures with cues ($M = 31.54$, $SD = 5.14$) and the groups viewing lectures with no cues ($M = 28.78$, $SD = 6.14$), $t = -2.49$ (102), $p < .05$. Because the groups viewing the lectures with high immediacy perceived the teacher to be more immediate, and the groups viewing lectures with organizational cues perceived the teacher to be more organized, the manipulation was successful.

Students indicated how similar the videotaped lecture was to lectures in other classes by identifying whether it was very similar, somewhat similar, or not similar to other lectures, excluding from consideration the fact that the lecture was on video. Students' perceptions of similarity were generally consistent regardless of which version of the lecture they viewed—chi-square tests indicated that the pattern of responses did not depart significantly from what one would expect to find in a random distribution, immediacy χ^2 (3, $n = 104$) = 1.34, $p > .05$, organizational cues χ^2 (3, $n = 104$) = 4.17, $p > .05$. This finding gives no reason to suspect that either of the manipulations was perceived as more or less natural than the other.

Primary Analyses

Hypothesis 1 predicted that the two measures of notetaking effectiveness would be positively related to students' scores on the three achievement tests. Correlation coefficients for all relationships are reported in Table 1. Each of the correlations was significant and positive, which is consistent with the prediction made in Hypothesis 1.

Hypotheses 2 through 5 predicted main effects for both immediacy and organizational cues on the dependent variables of note details and note organization. Two separate factorial ANOVAs were calculated to test these hypotheses. The factorial ANOVAs were used because main effects (as reflected in the hypotheses) as well as

Table 2 Means and Standard Deviations for Note Details and Note Organization by Group

Groups		Note details		Note organization	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low Immed.	With cues	13.08	3.53	15.38	4.66
	No cues	10.85	2.39	9.00	2.95
	Total	12.03	3.22	12.36	5.06
High Immed.	With cues	11.58	4.35	13.60	4.90
	No cues	9.43	3.32	7.87	3.11
	Total	10.53	3.99	10.80	5.00
Overall Totals		11.35	3.65	11.65	5.07

potential interaction effects could be identified. For the first factorial ANOVA, note details were entered as the dependent variable. The main effects for both organizational cues, $F(1, 100) = 10.38$, $\eta^2 = .09$, and immediacy, $F(1, 100) = 4.60$, $\eta^2 = .03$, were significant ($p < .05$); the interaction effect was not, $F(1, 100) = .044$, $p > .05$, $\eta^2 = .00$. As indicated by the means reported in Table 2, students viewing the lectures with prominent organizational cues recorded more details than students viewing lectures with minimal organizational cues. Students viewing the lectures with low immediacy recorded more details in their notes than students who viewed the lectures with high immediacy. Collectively, these results are consistent with the predictions made in Hypotheses 2 (the number of details recorded in students' notes will be significantly different depending on whether the teacher displays high or low levels of immediacy) and 4 (the number of details recorded in students' notes will be greater when the lecture contains prominent organizational cues and smaller when the lecture does not).

The second factorial ANOVA included organizational points recorded in students' notes as the dependent variable, and the immediacy and cues factors as independent variables. The main effect for the organizational cues factor was significant, $F(1, 100) = 58.27$, $p < .05$, $\eta^2 = .36$; however, neither the main effect for immediacy, $F(1, 100) = 3.36$, $p > .05$, $\eta^2 = .02$, nor the interaction effect, $F(1, 100) = .17$, $p > .05$, $\eta^2 = .00$, was significant. As indicated by the means reported in Table 2, students viewing the lectures with prominent organizational cues recorded more organizational points in their notes than did students who viewed lectures without explicit cues. These findings are consistent with Hypothesis 5 (the number of organizational points recorded in students' notes will be greater when the lecture contains prominent organizational cues and smaller when the lecture does not) but inconsistent with Hypothesis 3 (the number of organizational points recorded in students' notes will be significantly different depending on whether the teacher displays high or low levels of immediacy).

Post Hoc Analysis

Results of the primary analysis indicated a small, yet significant, negative effect for teacher immediacy on students' notation of lecture details. One potential explanation for this finding is that higher levels of immediacy diminish students' ability to learn information presented during a lecture. Such an explanation is consistent with the delivery distraction hypothesis as well as Comstock et al.'s (1995) conclusion that a curvilinear, inverted "U" relationship exists between teacher immediacy and students' cognitive learning. Because this experiment did not include a moderate immediacy condition, the curvilinear relationship could not be directly tested.

Post hoc tests were performed to determine whether a curvilinear relationship could be detected between students' perceptions of teacher immediacy and measures of notetaking effectiveness. After recoding values for students' perceptions of teacher immediacy into quartiles, one-way ANOVAs with quadratic planned comparisons were calculated. Neither of the tests was significant, note details $F(1, 98) = .03$, $p > .05$, note organization $F(1, 98) = .23$, $p > .05$.

Discussion

When listening to lectures, students must be active and vigilant. Although students record a relatively small number of ideas in their notes (Kiewra, 1985), the notes they do record have a dramatic impact on their learning (Rickards & Friedman, 1978). Consequently, the objectives of this study were (a) to further explore the relationship between notetaking and learning from lectures and (b) to determine the effects of teacher immediacy and organizational cues on students' notetaking effectiveness. Using videotaped lectures, identical in content but manipulated to either highlight or de-emphasize immediacy and organizational cues, this study found that the use of prominent organizational cues dramatically improves students' notetaking effectiveness, that immediacy cues may detract from notetaking, and that both details and organizational points recorded in students' notes are positively related to students' learning from lectures.

Hypothesis 1 predicted that the two measures of notetaking effectiveness would be positively related to students' scores on recall tests. Previous research on notetaking has operationalized notetaking effectiveness in terms of the quantity of notes recorded by students (Locke, 1977). Like Titsworth and Kiewra (2004), this study analyzed two specific elements of notetaking effectiveness: note organization and note details. Correlation coefficients indicated that Hypothesis 1 was tenable. Both the number of details and number of organizational points recorded in students' notes were positively associated with students' scores on each of the recall tests. This finding is consistent with previous research demonstrating the link between notetaking and test performance (Kiewra, 1984; Titsworth & Kiewra, 2004).

Using students' notes to determine how much they learn from a particular lecture or class could provide instructional communication researchers with a valuable new

tool for assessing cognitive learning. Since Richmond and McCroskey's (1986) use of the learning loss scale, many instructional communication researchers have relied exclusively on self-report measures of learning to assess the instructional impact of teacher communication behaviors. Although Chesebro and McCroskey (2000) argue that construct validity for the learning loss measure is supported by the negative correlation observed in their study, Hess and Smythe (2001) suggest that such evidence is "not compelling" and that the learning loss measure is potentially confounded by a halo effect (see p. 203). The average correlation between three different recall tests and two measures of notetaking effectiveness observed in this study ($r_{ave} = .53$) was slightly larger than those observed by Chesebro and McCroskey ($r = -.50$) as well as Witt and Wheelless (2001; $r = -.21$) who both examined the relationship between students' learning loss scores and their performance on recall tests. Because students took notes prior to the exams, the notetaking-recall relationship is less susceptible to the halo effect criticism. Consequently, analysis of notetaking provides a potentially viable alternative to either self-report measures or recall tests for assessing students' cognitive learning.

Hypotheses 2 and 3 predicted that teacher immediacy would influence the number of details and organizational points recorded in students' notes. Analysis of variance procedures indicated that in conditions of high immediacy, students recorded fewer details but the same number of organizational points as students viewing low-immediacy lectures. Hypothesis 2 was supported, but Hypothesis 3 was not. The specific finding that students record fewer details when viewing lectures with high immediacy is consistent with McCaleb and White's (1980) delivery distraction hypothesis. That is, students may become so involved with the teacher's delivery that they fail to attend to important concepts being discussed.

The finding that high immediacy may reduce the likelihood that complete notes are recorded raises questions about the reported relationship between teacher immediacy and students' cognitive learning. Although previous studies have found consistent positive relationships between student reports of teacher immediacy and their own perceptions of their cognitive learning (e.g., McCroskey et al., 1996), such studies assume that self-reports are valid techniques for assessing cognitive learning. If notetaking serves as an indicator of what students are processing, failing to record information in notes is a sign that higher levels of immediacy may detract from cognitive learning, or at least impede the likelihood that students learn details presented during a lecture. Such a conclusion is not only consistent with results of the current study, but also consistent with results reported by Comstock et al. (1995) documenting the inverted "U" relationship between teacher immediacy and student learning. Of course, the negative effect observed in this study was very small, and post hoc tests could not detect a significant curvilinear trend between students' perceptions of teacher immediacy and notetaking effectiveness. Although concluding that higher levels of teacher immediacy cause students to learn less is unwarranted at this time, the apparent inconsistent findings between studies using self-report and other measures of cognitive learning deserves continued investigation.

Hypotheses 4 and 5 predicted that organizational lecture cues would improve students' notetaking effectiveness. Indeed, using prominent organizational cues had both significant and meaningful effects on students' notetaking behaviors. Based on effect size estimates, organizational cues accounted for 9% of the variance in the number of details recorded by students and 36% of the variance in organizational points recorded by students. From a lecture-listening perspective, organizational cues likely help students organize and encode information more efficiently because they do not have to expend working memory resources to determine structure.

The finding that organizational cues improve notetaking effectiveness adds new information to literature addressing the topic of lecture cues. First, few studies have explored the connection between oral lecture cues and notetaking. For example, both Titsworth (2001b) and Chesebro (2003) found that a teacher's oral clarity improves students' performance on recall tests. Results of the current study are consistent with those findings, but provide a more detailed account of how students listen to, and process, information prior to recall. Specifically, studying the effects of oral cues on notetaking provides clearer evidence of how students process lecture information as the lecture progresses. Second, previous research on lecture organization has generally ignored the most obvious element of lecture clarity: transitional statements and signposts. For example, the impressive program of research carried out by Smith and Land (see Smith, 1985; Smith & Land, 1981) operationalized clarity in terms of language specificity. Even Chesebro's study operationalized teacher clarity by combining several elements of the construct into a "profile of the clear teacher" rather than discrete clarity behaviors (see p. 135). The current study examines organizational cues, which emphasize the macro-organization of lectures and are more easily controlled by teachers.

Taken together, the findings of this study suggest that students are able to process information more effectively when lecturers use obvious organizational cues. In such situations, students record more details and more organizational points in their notes—two characteristics of notes that result in significant success on tests of recall. Although immediacy is undoubtedly an important motivational tool for teachers, using teacher immediacy appears to distract students from recording details. Based on these findings, teachers are encouraged to think strategically about their use of lecture cues. Incorporating organizational cues appears to pay substantial dividends, and overuse of immediacy could be somewhat counterproductive to learning. Although eliminating immediacy is not advisable because of the positive effect that teacher immediacy has on students' affect, teachers and researchers should carefully consider how immediacy should strategically be used during lectures. Moreover, instructional communication researchers should continue exploring the effects of immediacy on learning. Although this study provides a singular snapshot of how teacher immediacy may have a small negative impact on learning, additional research should consider the long-term effects of teacher immediacy on students' affective learning and how those effects promote cognitive learning (see Rodriguez et al., 1996).

Interpreting the results of this study requires consideration of some limitations. First, the videotaped lectures allowed for maximum control over extraneous

variables but also diminished the ecological validity of the experiment. Although several recent studies (e.g., Chesebro, 2003; Titsworth, 2001a, 2001b) have used videotapes to manipulate immediacy, it is probable that videotaped lectures are unable to capture fully elements of high immediacy. Second, in typical classrooms, students are tested weeks or even months after listening to a lecture. Because this study examined notes taken during a lecture, generalization to standard classroom testing must be tempered. Additionally, the content of the lectures could have interacted with other variables to influence students' notetaking and learning. Future research could address each of these limitations by following Comstock et al.'s (1995) approach of using live lectures and controlling for immediacy. Live lectures could easily control for organization and would be more natural for students. Future efforts should also vary the content of lectures because content could influence the relative impact of immediacy on students' affective and cognitive learning. Future research should also begin comparisons between written lecture cues (e.g., Power-Point) and oral cues to determine whether the two formats interact to create even greater benefits for students. Finally, additional attention should be given to the viability of using students' notes as an index of cognitive learning. Coding students' notes in the current study was relatively easy because the lectures were scripted, and consequently, it was possible to examine notes for organizational points and details addressed in the lecture. Plans are currently underway to develop a reliable scoring procedure for notes from diverse classes so that the relationship between teachers' lecture behaviors and student notetaking can be explored in more naturalistic settings.

As long as lecturing remains commonplace in college and university classrooms, the Holy Grail of good notes will remain an important objective for students. Although communication scholars have done much to help us understand classroom communication, notetaking has remained only on the periphery of such research. The current study confirms the importance of notetaking and highlights the role of teachers' communication behaviors in the listening-notetaking process. Additional research on this topic will provide practical information for teachers and will provide an important new direction for communication-based research merging the common interests of instructional communication and educational psychology.

References

- Andersen, P., & Andersen, J. (1982). Nonverbal immediacy in instruction. In L. Barker (Ed.), *Communication in the classroom* (pp. 98-120). Engelwood Cliffs, NJ: Prentice-Hall.
- Armbruster, B. B. (2000). Taking notes from lectures. In R. F. Flippo & D. C. Caverly (Eds.), *Handbook of college reading and study strategy research*. Hillsdale, NJ: Erlbaum.
- Badger, R., White, G., Sutherland, P., & Haggis, T. (2001). Note perfect: An investigation of how students view taking notes in lectures. *System*, 29, 405-417.
- Bretzing, B., & Kulhavy, R. (1979). Notetaking and depth of processing. *Contemporary Educational Psychology*, 4, 145-153.
- Carrier, C., Williams, M., & Dalagard, B. (1988). College students' perceptions of notetaking and their relationship to selected learner characteristics and course achievement. *Research in Higher Education*, 28, 223-239.

- Chesebro, J. L. (2003). Effects of teacher clarity and nonverbal immediacy on student learning, receiver apprehension, and affect. *Communication Education*, 52, 135-147.
- Chesebro, J. L., & McCroskey, J. C. (2000). The relationship between students' reports of learning and their actual recall of lecture material: A validity test. *Communication Education*, 49, 297-301.
- Comstock, J., Rowell, E., & Bowers, J. (1995). Food for thought: Teacher nonverbal immediacy, student learning and curvilinearity. *Communication Education*, 44, 251-266.
- Cowan, N. (1995). *Attention and memory: An integrated framework*. New York: Oxford University Press.
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- Dunkel, P., & Davy, S. (1989). The heuristic of lecture notetaking: Perceptions of American & international students regarding the value & practice of notetaking. *English for Specific Purposes*, 8, 33-50.
- Fisher, J., & Harris, M. (1973). Effect of notetaking and review on recall. *Journal of Educational Psychology*, 65, 321-325.
- Gorham, J. (1988). The relationship between verbal teacher immediacy behaviors and student learning. *Communication Education*, 37, 40-53.
- Hartley, T., & Davies, I. (1978). Note-taking: A critical review. *Programmed Learning and Educational Technology*, 15, 207-224.
- Hess, J. A., & Smythe, M. J. (2001). Is teacher immediacy actually related to student cognitive learning? *Communication Studies*, 52, 197-219.
- Johnson, C., Vinson, L., Hackman, M., & Hardin, T. (1989). The effects of an instructor's use of hesitation forms on student ratings of quality, recommendations to hire, and lecture listening. *Journal of the International Listening Association*, 3, 32-43.
- Kelley, D., & Gorham, J. (1988). Effects of immediacy on recall of information. *Communication Education*, 37, 198-207.
- Kiewra, K. A. (1984). Acquiring effective notetaking skills: An alternative to professional notetaking. *Journal of Reading*, 27, 299-301.
- Kiewra, K. A. (1985). Students' notetaking behaviors and the efficacy of providing the instructor's notes for review. *Contemporary Educational Psychology*, 10, 378-386.
- Kiewra, K. A., Benton, S. L., & Lewis, L. B. (1987). Qualitative aspects of notetaking and their relationship with information-processing ability and academic achievement. *Journal of Instructional Psychology*, 14, 110-117.
- Locke, E. (1977). An empirical study of lecture note taking among college students. *The Journal of Educational Research*, 77, 93-99.
- Mayer, R. E. (1977). The sequencing of instruction and the concept of assimilation to schema. *Instructional Science*, 6, 369-388.
- McCaleb, J., & White, J. (1980). Critical dimensions in evaluating teacher clarity. *Journal of Classroom Interaction*, 15, 27-30.
- McCroskey, J., Sallinen, A., Fayer, J., Richmond, V., & Barraclough, R. (1996). Nonverbal immediacy and cognitive learning: A cross-cultural investigation. *Communication Education*, 45, 200-211.
- Mehrabian, A. (1981). *Silent messages: Implicit communication of emotions and attitudes* (2nd ed.). Belmont, CA: Wadsworth.
- O'Hair, M., O'Hair, D., & Wooden, S. (1988). Enhancement of listening skills as a prerequisite to improve study skills. *Journal of the International Listening Association*, 2, 113-128.
- Palmatier, R., & Bennett, J. (1974). Notetaking habits of college students. *Journal of Reading*, 18, 215-218.
- Richmond, V., & McCroskey, J. (1986). The relationship between selected immediacy behaviors and cognitive learning. *Communication Yearbook* 10, 574-590.

- Rickards, J., & Friedman, F. (1978). The encoding versus the external storage hypothesis in note taking. *Contemporary Educational Psychology*, 3, 136-143.
- Rodriguez, J., Plax, T., & Kearney, P. (1996). Clarifying the relationship between teacher nonverbal immediacy and student cognitive learning: Affective learning as the central causal mediator. *Communication Education*, 45, 293-305.
- Ryan, M. P. (2001). Conceptual models of lecture learning: Guiding metaphors and model-appropriate notetaking practices. *Reading Psychology*, 22, 289-312.
- Scerbo, M., Warm, J., Dember, W., & Grasha, A. (1992). The role of time and cuing in a college lecture. *Contemporary Educational Psychology*, 17, 312-328.
- Schonwetter, D. (1993). Attributes of effective lecturing in the college classroom. *The Canadian Journal of Higher Education*, 23, 1-18.
- Smith, L. (1985). Teacher clarifying behaviors: Effect on student achievement and perceptions. *Journal of Experimental Education*, 53, 162-169.
- Smith, L., & Land, M. (1981). Low-inference verbal behaviors related to teacher clarity. *Journal of Classroom Interaction*, 17, 37-41.
- Streiner, D. L. (2003). Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment*, 80, 99-104.
- Titsworth, B. S. (2001a). Immediate and delayed effects of interest cues and engagement cues on students' affective learning. *Communication Studies*, 52, 169-179.
- Titsworth, B. S. (2001b). The effects of teacher immediacy, use of organizational lecture cues, and students' notetaking on cognitive learning. *Communication Education*, 50, 283-297.
- Titsworth, B. S., & Kiewra, K. A. (1998, April). *By the numbers: The effect of organizational lecture cues on notetaking and achievement*. Paper presented at the American Educational Research Association Convention, San Diego, CA.
- Titsworth, B. S., & Kiewra, K. A. (2004). Organizational lecture cues and student notetaking as facilitators of student learning. *Contemporary Educational Psychology*, 29, 447-461.
- Witt, P. L., & Wheelless, L. R. (2001). An experimental study of teachers' verbal and nonverbal immediacy and students' affective and cognitive learning. *Communication Education*, 50, 327-342.

Received April 20, 2003

Accepted August 20, 2003

Copyright of Communication Education is the property of Routledge, Ltd. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.